The Federal Science eLibrary

Service to Scientists in the Federal Government

Business Case

Strategic Alliance of Federal Science and Technology Libraries

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Overview
The Federal Science eLibrary seeks to build increased research capacity for the benefit of federal researchers[1] and, ultimately, the Canadian public. Canadian federal researchers lack desktop access to many key publications in science, technology and medicine (STM). Federal libraries are inadequately funded to deliver seamless and equitable access to electronic journal (e-journal)[2] content for government researchers. Canadian academic libraries faced the same challenge and have achieved success by leveraging an investment from the Canada Foundation for Innovation (CFI) and forming a consortium to purchase several major packages of electronic journals and databases. The eLibrary initiative proposes a similar coordinated approach to funding and negotiating e-journal licenses for the benefit of federal government researchers.

Objective
The Federal Science eLibrary is an initiative to solicit government support for a proposal to deliver enhanced seamless and equitable access to full-text electronic journal content in STM to the desktops of all federal government researchers. The eLibrary will be a new collaboration among the science-based departments and agencies to negotiate, license and support access to STM electronic journals. The Government of Canada employs more than 22,000 professionals[3] to support key activities in strategic research, environmental and health protection, regulatory activity, defense and emergency preparedness. By helping federal government researchers do their work better, the eLibrary will serve the needs of the Canadian public.

The federal government lags behind the academic and many private sectors in providing access to a significant number of e-journals. STM journals cover the full spectrum of science from basic and applied research, technical analysis, product development, market assessment, product reviews, regulatory assessments and product evaluations. Most major STM journals are available in electronic formats that provide convenient and timely access to information anywhere and at any time.   Desktop access to e-journals is now a standard tool in universities and large private sector companies.

This initiative is in the best interests of all Canadians. With adequate information resources available conveniently and quickly, federal scientists will be prepared to face new health, environmental and security threats. Policy analysts will be equipped with better information resources with which to define and evaluate policy. Federal STM professionals co-located in departments and researchers collaborating with scientists in university or private sectors will be equipped to participate fully in shared research activities.

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[1] For the purposes of this business case, researcher is used as a broad term that includes scientists, policy analysts and decision makers employed by the federal government
[2] E-journals are peer-reviewed journals available online, whether or not they are available in conventional, printed format
[3] The number of federal employees in the scientific and professional occupational category (Dec. 2001)

Opportunities and Risks

By implementing the Federal Science eLibrary, all federal researchers will have equitable access to important published information when they need it. Disparities that now exist across regions, among STM departments and between urban and rural locations will disappear.

Access to journal content in electronic format will save researchers' time, increasing the number of hours available for research work. A conservative estimate is that federal STM departments will save $24M annually in unproductive search time by providing an adequate package of electronic titles. This is based on 22,000 researchers each saving 21 hours of search time annually, making 462,000 additional hours available for research and related activities. This figure is close to that suggested by Tenopir and King where, in their survey, scientists indicate that they may save as much as 24 hours per year per person by having electronic access to library journals.[4]

Scholarly communication is rapidly evolving within a totally electronic environment. Research articles are now peer reviewed, disseminated and stored uniquely in electronic formats. With the implementation of the Federal Science eLibrary, federal researchers will keep pace with their academic and private sector colleagues in transitioning to new communication formats.

With the eLibrary in place, government libraries will see less duplication of effort in establishing licenses for e-journals because shared negotiations, license management and a common infrastructure would centralize this work. There will also be some small reduction in the work of maintaining a print collection, for example, checking-in and claiming issues, labeling, circulation, shelving, binding and document delivery services. Demands for storage space will diminish over time and eventually print collections may be shifted to allow room for other library and learning activities. Overall, in each departmental library, a small amount of staff time would be released for provision of new value-added services to clients. Those include user instruction, training and problem resolution for electronic titles and more in-depth analysis of information.

If the eLibrary is not implemented the following risks have been identified:
- Lack of adequate access to STM content will result in a continuing loss in researcher productivity and a limited capacity to respond quickly to crisis situations
- Opportunities for collaboration, communication and linkages with researchers in academic and commercial sectors nationally and internationally will be compromised
- The ability to promote and support multi-disciplinary, cross-departmental research initiatives will be diminished
- An opportunity to integrate open access publications into a common information infrastructure will be lost
- Government will fail to attract and retain recent university graduates who are accustomed to state-of-the-art information tools
- The government's objectives for excellence in S&T research and innovation will be threatened and the government's goals for Canada's 21st century economy will be compromised.

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[4] King, D.W. and C. Tenopir "Scholarly journal and digital database pricing: threat or opportunity?" Chapter 3 in Jeffrey Mackie-Mason and W. Lougec, eds. Bits and Bucks: Economics and Usage of Digital Collections Cambridge, Mass. : MIT Press, 2004 (in press); p. 16 - Draft online at http://www.si.umich.edu/PEAK-2000/king.pdf

Background

The Federal Science eLibrary is an initiative led by the Strategic Alliance of Federal Science and Technology Libraries (Strategic Alliance), an alliance of the five major STM departments (Agriculture and Agri-Food Canada, Environment Canada, Fisheries and Oceans Canada, Health Canada, Natural Resources Canada) as well as the National Research Council of Canada's Canada Institute for Scientific and Technical Information (CISTI). Members of the Strategic Alliance have a common purpose to provide needed STM information to their users and to federal researchers in the eighteen science-based departments in Canada. Beginning in 1997 and in the course of carrying out NRC's mandate to serve as Canada's national science library[5], CISTI has licensed a large number of electronic journals for NRC and created an infrastructure and common support processes to provide desktop access to this content. Because of CISTI's experience in providing access to e-journals, NRC/CISTI is acknowledged as the lead partner for the Federal Science eLibrary.

CISTI is working to build an STM information network to provide universal, seamless and permanent access to information for Canadian research and innovation. The eLibrary is an important first step in achieving the goal of a national information infrastructure.

There is strong support for the Federal Science eLibrary initiative from the Assistant Deputy Ministers (ADMs) of the six departments and agency and the S&T ADM Committee. The initiative is also consistent with recommendations in the recent report[6] of the Council of Science and Technology Advisors (CSTA).[7] Among the benefits of linkages that the report identifies:
- Generation, dissemination and translation of knowledge. Linkages support 'knowledge mobilization', the sharing of information that not only transmits knowledge but also creates opportunities to generate new knowledge, translates knowledge into new applications and facilitates the dissemination and commercialization of results.
- Currency with S&T advances so that researchers have knowledge of the latest S&T developments. This is key in Canada because the majority of S&T is conducted outside of government and often even outside of the country.

Two key challenges to establishing S&T linkages:
- Traditional vertical departments structured mainly to provide S&T based solutions to issues in their specific jurisdictions.
- Rigidity in the vertical structure impedes horizontal cooperation.

The theme of the Federal Science and Technology Forum held in January 2005 was *'Moving from Collaboration to Integration'.* Integration requires an in-depth form of collaboration. The goal is to address significant national issues that cut across the mandates of more than one department or agency. The Federal Science eLibrary would provide a solid foundation for knowledge integration across all STM departments.

Feasibility Study

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[5] National Research Council Act, Section 5 (1), (i) "establish, operate and maintain a national science library" (August 1989)

[6] Council of Science and Technology Advisors. *Linkages in the National Knowledge System (LINKS): Fostering a Linked Federal S&T Enterprise.* February 2005

[7] The Council of Science and Technology Advisors (CSTA) is a group of experts, external to government. The Council provides strategic advice to the Government of Canada on the management of its internal science and technology (S&T).

In 2002, the Strategic Alliance produced a business case (*The Case for a Federal Science eLibrary*). In 2003, a feasibility study (*Federal Science eLibrary: Building the STM Knowledge Infrastructure – a Feasibility Study*) was completed. This study included a web survey of researchers. More than 2,200 federal scientists responded, describing their needs for electronic access to journal literature. Although most researchers have access to STM journals through departmental library subscriptions (either paper or online), many reported that they do not have access to a large number of the titles they need. Researchers also experience different levels of service with respect to the availability of and access to STM information. Easy access to a good range of STM literature is limited to employees in large departments located in urban centres. Researchers in smaller agencies or remote locations face long delays in obtaining print titles, and have very limited or no access to electronic titles. The following is from a quotation from a researcher at Environment Canada:

> *I cannot stress how disruptive it is to my thought train and process and workflow to have to physically go to the library and photocopy material I need. Electronic access is the only reasonable solution.*

Those federal researchers who have a cross-appointment or a recognized affiliation with a university are authorized to access the e-journals licensed by that university. However, 78% of survey respondents have no formal affiliation with a university, meaning that they have no access to a university's electronic journals.

The feasibility study also undertook a budget survey of the Strategic Alliance libraries. The findings showed that the purchasing power and the number of journals held by libraries have decreased in the face of steeply rising subscription prices. For the five science departments, though journal budgets have remained constant, the number of journal titles purchased has decreased by 22% over the past ten years. Buying subscriptions to electronic formats rather than print is not a solution to budget problems because e-journals are as expensive as print formats. In addition, libraries cannot devote their total budgets to e-journals because there is still a need to purchase books, audio-visual materials and certain specialized publications that are still required in print.

To realize the vision of the Federal Science eLibrary, new investment is needed. Combining the journal budgets of the STM federal libraries will not result in sufficient resources to license a critical core of e-journal content. The Canadian Research Knowledge Network (CRKN)[8] received $20M in funding from the Canada Foundation for Innovation (CFI). This sum was leveraged to $50M over a 3-year period, making it possible for the academic institutions to transition to a new knowledge infrastructure.

CRKN has been recognized internationally, has proven to be a successful model for Canadian academic institutions and could be tailored to provide a similar solution for the government's own STM researchers. Federal government departments are not eligible to participate in CRKN because only recognized degree-granting institutions were eligible to access CFI funding. Once the federal government has its own eLibrary there may be opportunities for consortial arrangements with CRKN.

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[8] Prior to April 2004 the Canadian Research Knowledge Network (CRKN) was known as the Canadian National Site Licensing Project (CNSLP).
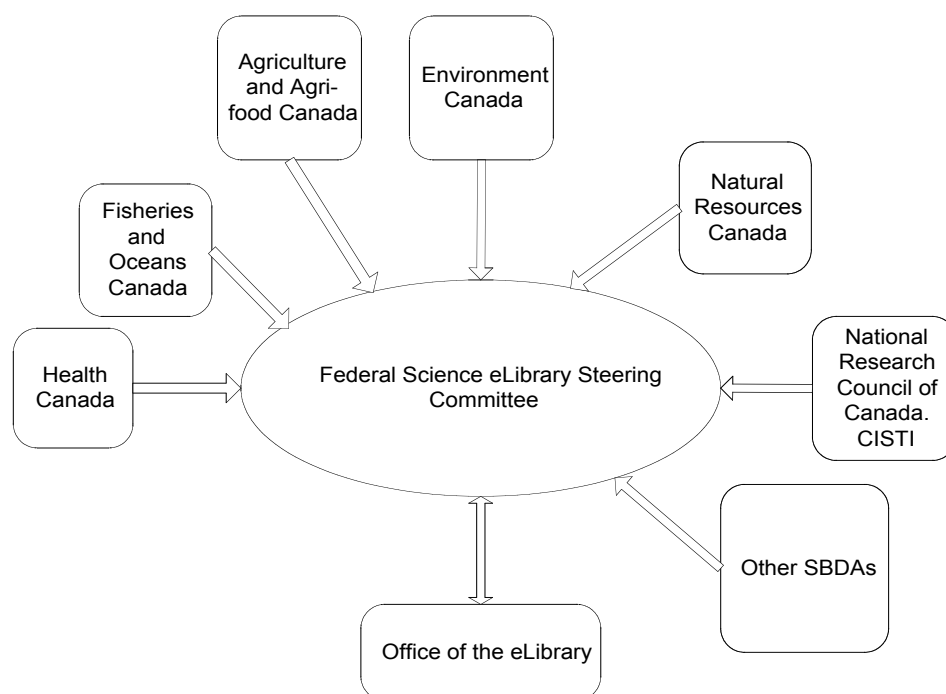
The Federal Science eLibrary feasibility study recommends that the eLibrary be created with a budget of $45M over five years. The major portion of this amount ($36M or 86%) would be used to license access to electronic journals. In the feasibility study, IT expenditures are calculated to be $3.2M (7.7%), salaries are $1.5M (3.5%) and operating expenses are $1.2M (2.8%).

Proposed Federal Science eLibrary Budget (in dollars)[9]

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	Total
E-content		7,426,300	7,723,300	11,215,800	11,664,600	38,030,000
IT	1,856,600	384,000	388,300	391,500	406,300	3,426,700
Salaries	222,800	343,700	349,000	355,400	360,700	1,631,600
Operating	175,000	285,400	285,400	286,400	286,400	1,318,600
Totals	2,254,400	8,439,400	8,746,000	12,249,100	12,718,000	**44,406,900**

Proposed Funding and Governance Model
The governance model proposed in the June 2002 business case and recommended in the feasibility study calls for shared governance, centralized administration and funding.

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[9] Based on the budget developed for the Federal Science eLibrary feasibility study (2002). Figures have been adjusted to reflect an inflation rate of 3% for each of the two years since the study was completed. The original budget may be found at: http://safstl-asbstf.scitech.gc.ca/feasStudy/implementing_e.shtml

The Federal Science eLibrary will adapt the model established by CRKN. Representatives from the six federal departments and agency and other SBDAs[10] will form a Federal Science eLibrary Steering Committee to be responsible for policy, priorities, publisher negotiations, license agreements, resource allocation and user consultation. CISTI and the federal departments will enter into a Memorandum of Understanding (MOU) that would describe the governance and funding structure.

The Steering Committee would establish a Federal Science eLibrary Office with a manager and staff responsible for the operational activities of the eLibrary. The eLibrary Office would be located at CISTI where space, expertise and an advanced information infrastructure are in place. The Steering Committee would authorize CISTI to execute negotiated license agreements and expend funds.

The Manager of the eLibrary Office would have responsibilities for the RFP proposal process and negotiations with publishers.

Benefits for Researchers:
Access to the content of an increased number of STM journals will improve the research activities of federal scientists. Of the respondents to the Federal Science eLibrary survey:

- 98% agreed or strongly agreed that journals continue to be essential tools
- 59% spend more than 3 hours a week actively reading scientific publications
- 94% said that access to e-journals shortens the time they spend searching and retrieving information
- 74% said that desktop access increases the number of articles they read outside their primary discipline.

In a large US survey, over 40% of scientists reported that their readings were essential for their research and that they resulted in savings. Savings were identified as avoiding some primary research, stopping an unproductive line of research, or modifying research, analysis or engineering design.[11]

The journal *The Scientist* annually surveys post-doctoral researchers from the US and Canada on the best places to work.[12] In the 2005 summary, access to books and journals ranked second highest in a list of ten factors important to post-doctoral researchers. Only training and experience for future career placed higher. In the 2004 survey, the researchers rated access to publications and journals as the most important attribute.

Access to journal content in electronic format will increase the use of the journals. Findings from academic libraries show that users access journals two to three times more often when they are available in electronic format.

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[10] SBDAs are Science-Based Departments and Agencies of the federal government
11 Tenopir, C. and D.W. King "Designing electronic journals with 30 years of lessons from print" Journal of Electronic Publishing, Dec. 1998; p. 6. (http://www.press.umich.edu/jep/04-02/king.html)
[12] The Scientist. Best places to work for postdocs: 2005. February 14, 2005 issue page 44; and 2004. February 16, 2004 issue page 17

News, bulletins and the latest research findings are available first online before they appear in print. Desktop access also provides:

- Extended search functionality
- Easy linking across publications
- Alerting services
- Managing citations through software programs
- Ability to forward and save
- Multiple accesses to the same content

E-journals promote inter-disciplinary and cross-departmental activities and promote collaborative work with academic and private sectors. This is of critical importance to the government's work in meeting the challenges of new disease outbreaks such as SARS, Mad Cow Disease and West Nile Virus. Successful implementation of the Kyoto Accord will require the latest scientific evidence and a collaborative approach to addressing greenhouse gas emissions and climate change. Efforts to improve air and water quality and biodiversity – all issues identified in the *2003 Annual Report to Parliament*[13] – will be enhanced if researchers have seamless access to relevant e-journal content.

Benefits for Libraries:
Currently, access to electronic journals in the six STM federal departments and agency is inequitable and inadequate. The federal government provides access to only a limited number of the more than 5,000 STM e-journals now published. Though there may be some current duplication in print and electronic access across the departments, the overlap in titles is insignificant in comparison to the number of new titles that should be acquired.

To provide a quality working environment for researchers, the government needs to invest in more e-journals. The experience of the CRKN model has shown that site licensing yielded lower subscription prices than libraries could have negotiated on their own. If libraries were to negotiate separately with new funding, their negotiation positions would be weak. In fact, individual departments would have difficulty in attracting the attention of major publishers. The best and most economical way for the federal government to purchase electronic content is for the departments and agencies is to negotiate licenses as a consortium.

The consortium model for government library negotiations and purchasing exists and has been successful. The Council of Federal Libraries Consortium negotiates volume discounts for departmental purchases of e-resources for federal libraries that choose to participate. The Federal Science eLibrary would be a horizontal initiative with new funding that would negotiate, purchase and provide single window access to electronic resources. It would also be closely aligned to S&T initiatives that would be integral to STM research and policy development across government.

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[13] Canada's Performance 2003: Annual Report to Parliament. Report of the President of the Treasury Board (http://www.tbs-sct.gc.ca)

Benefits of Utilizing Existing Common Technology Platforms:
The eLibrary will leverage the considerable infrastructure investments that have already been made by the federal government. The STM departments have basic desktop and communications technologies to deliver e-content in most government offices. The survey of federal researchers found that 80% of respondents have access to a computer, email and the Internet at work and at home and, of these, 47% have high speed Internet.

Content for the eLibrary will be available through a web portal. This will enable researchers to access and exploit the electronic content, search across multiple publisher sites and create a personal space (My eLibrary). The eLibrary will draw on the experience of Strategic Alliance members in creating Virtual Libraries and on CISTI's experience in building the infrastructure and applications to support desktop access to information.

Benefits of Building a Federal Science eLibrary Infrastructure:
Once built and fully operational, the eLibrary infrastructure could serve as a model for other government departments and could be leveraged as the backbone for a wider information delivery service. Other departments seeking to license publications in R&D, policy analysis, innovation or commercialization could use the eLibrary resources – negotiation team, authentication system, servers and web presence – to deploy content.

The eLibrary infrastructure could also index and make available to the Canadian public departmental publications, reports and working papers that are not part of the open literature. These documents are key federal government assets that are not easily accessed and subsequently are underutilized. Providing a platform for this information for all federal scientists will ensure that the investment in creating these works is maximized.

Looking forward, once the eLibrary infrastructure is in place and operational, it could serve as the basis of an information network for non-government agencies – R&D organizations, non-academic health institutions, provincial research agencies – organizations currently not served by CRKN.

In Europe, the model is for national libraries to work in collaboration with university libraries. The implementation of the eLibrary would allow this model to grow in Canada.

The Federal Science eLibrary Model has been proven successful
The Federal Science eLibrary follows a consortia model of acquiring licenses and deploying full-text content to library users that has been successful both in Canada and internationally. The technology is known and proven. The Strategic Alliance libraries have experience in e-journal license negotiations and making content available via the web.

Best results have been achieved by libraries coming together as consortia to negotiate with publishers to license e-journal content. The CRKN combined $20M in new funding from CFI with matching funding from 64 participating universities to license 700 STM electronic journals and databases. In the U.S., OhioLINK has negotiated for over 5,700 e-journals on behalf of 85 college and university libraries in the state. Access to content

is provided to users from inside the libraries and remotely. The California Digital Library licenses more than 8,000 journals and 200 databases on behalf of the University of California libraries. In Taiwan, STIC (Science and Technology Information Centre) has created an integrated infrastructure and negotiated licensed databases for all Taiwan's local academic and R&D community.

Current Status of the Proposal
NRC-CISTI has taken the lead in preparing this business case at the request of the S&T ADM Committee and in collaboration with the Strategic Alliance. The business case is being developed with a view to discussing it with Treasury Board Secretariat.

Resources Needed
An implementation plan will be developed once funding is received. The Strategic Alliance proposes that the federal government provide funding to cover the expenses of the eLibrary for the first five years. This will ensure that departments make a successful transition to a horizontal and collaborative approach to negotiating and licensing an important package of electronic journals.

The resource estimates cover the initial infrastructure (IT, salaries and operating expenses) for the first five years. Expenditures in year 1 are for setting-up the consortium office and purchasing any needed hardware or software. Year 2 would involve the negotiating and licensing of most of the content. In the subsequent years of the plan, licenses at a cost of $1M each would be added each year. Annual increases in the costs of licensing publications are estimated to be 4%. Long-term sustainability of the initiative would be addressed in the fourth year.

Essential Role of the Federal Government in this Initiative
In the February 2005 Federal budget speech the Finance Minister spoke of the importance of enhanced productivity so that Canada can adapt to changing times and compete internationally. In order to accomplish this, the Minister indicated that Canada needs to develop and utilize the fruits of science and technology.[14]

The Federal Science eLibrary will equip researchers so that they can realize the vision of improved competitiveness and productivity that will define Canada's 21st century economy. Seamless and equitable access to electronic content, and improved searching and linking functionality will allow federal researchers new opportunities to collaborate and innovate. The eLibrary will provide critical support to the federal government in advancing its agenda for science and technology.

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[14] Canada. Department of Finance. The Budget Speech 2005 – Delivering on Commitments

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